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### HIC Insights

Winter has proven to be quite benign over the majority of our area in terms of potential spring flooding. With the exception of the Upper Peninsula in Michigan, snow did not accumulate to the degree that would lead to moderate or major flooding. It has been many years since we have had so few points in the moderate flood category. Looking at our new Spring Snowmelt Flood Outlook for 2002, (Figure 1, page 2) areas of potential spring flooding are confined to the Upper Peninsula of Michigan. There is a chance for minor flooding along portions of the Mississippi River. None-the-less, we are well prepared this spring for any type of flooding and we do not expect a spring snowmelt situation similar to 2001.

In October of 2001 we began issuing the Significant Flood Outlook Product (FOP). This product is issued by all 13 RFCs and then mosaicked into one final product for the entire U.S. Our individual FOP can be viewed from our web site or from the national web site by "drilling down". The FOP is an outlook product that depicts moderate or severe flooding that is possible, likely, imminent or occurring over the 5-day period. We include 72 hours of QPF in our FOP. We began issuing a new and improved Spring Snowmelt Flood Outlook graphic this spring, which depicts locations that may experience no flooding

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## WFO White Lake and NCRFC Provide HAZMAT Spill Support

*- NWS Focus*

The Detroit Weather Forecast Office (WFO) in White Lake, MI and the North Central River Forecast Center (NCRFC) in Chanhassen, MN recently teamed with the NOAA Hazardous Materials Response Division to provide support to the state of Michigan for containment and clean-up of the largest oil spill in the Great Lakes in 10 years. On April 9, 2002, several thousand gallons of oil were discovered in the River Rouge near downtown Detroit, flowing into the Detroit River just upstream of the entrance to Lake Erie. The spill affected 27 miles of the River Rouge as well as the U.S. and Canadian sides of the Detroit River, including Gross Isle.

More than 120 people from seven local, state, and federal agencies, including NOAA and the NWS, participated in the response efforts. WFO Detroit and the NCRFC each provided NOAA Hazmat Response in the form of 1 to 2 daily support briefings through the week immediately following the spill. Weather Service hydrologists and meteorologists provided detailed 36-hour forecast briefings on river stages, flow discharge at the mouth of the River Rouge, precipitation amount, temperature, sky condition, wind, and visibility.

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# AHPS Product Generation Streamlined

- Robert Wavrin

The NCRFC has been producing a variety of AHPS products since March 1997, when the Des Moines River Basin demonstration project took place. In the years since this demonstration project, AHPS product generation has expanded to include a greater portion of the NCRFC's area of responsibility. From the initial forecast for the Des Moines River Basin, NCRFC now issues AHPS forecasts for 12 basins in 5 states. AHPS implementation across the entire NCRFC area is scheduled to be completed in 2005.

The expansion of the AHPS program has brought with it the normal growing pains associated with any program. The involvement of more RFC forecasters has increased the need for a streamlined method of creating and reviewing the forecasts. With the forecasts being displayed by more Weather Forecast Offices, a standardized AHPS web page needed to be developed so users could easily find the information they needed. NCRFC staff created a graphical user interface (GUI) to assist in the production of the forecasts while a national team designed an AHPS web page.

The GUI developed at NCRFC leads the forecaster through a six step process from reviewing the Climate Prediction Center Graphics, creating the products, viewing the graphics, and finally sending the products. This has simplified the AHPS process by eliminating the need to type long commands, and speeds up viewing of the graphics by placing six on a single screen.

## Snowmelt Outlooks

- Doug Merrigan

Snowmelt flooding is an annual concern for most of the NCRFC region. Each year can be uniquely different as a complex interaction of varied soil, precipitation, and temperature patterns come together to produce the final results that may range from little or no flooding to possibly severe or record flooding each spring.

Our snowmelt outlooks are written into text products and issued under the general header MSPESG\*\*\*. The early season "narrative only" outlook is issued under MSPESGMSR, while the later season "numerical" outlook products are currently broken down geographically under MSPESGIL, MSPESGMI, MSPESGMN, MSPESGMO, MSPESGND, and MSPESGWI. River basins that have been converted over to AHPS (Advanced Hydrologic Prediction Services) are handled separately with the issuance of Long Range Probabilistic Outlooks that are issued once each month throughout the year.

In addition to the above mentioned text products, NCRFC also generated a graphic for our website that summarizes the snowmelt outlook. This year we have combined our graphic with MBRFC's to provide a convenient "one-stop" snowmelt outlook graphic which covers the Central Region. The graphic depicts, with color-coded dots, the categorical snowmelt flooding potential (no/minor, minor, moderate, etc.) for each forecast point where snowmelt flooding is possible, or

expected, based on the observed and projected conditions on the date that the graphic was created. The graphic can be viewed at:

[http://www.crh.noaa.gov/ncrfc/flood\\_outlooks/floodmap.html](http://www.crh.noaa.gov/ncrfc/flood_outlooks/floodmap.html)

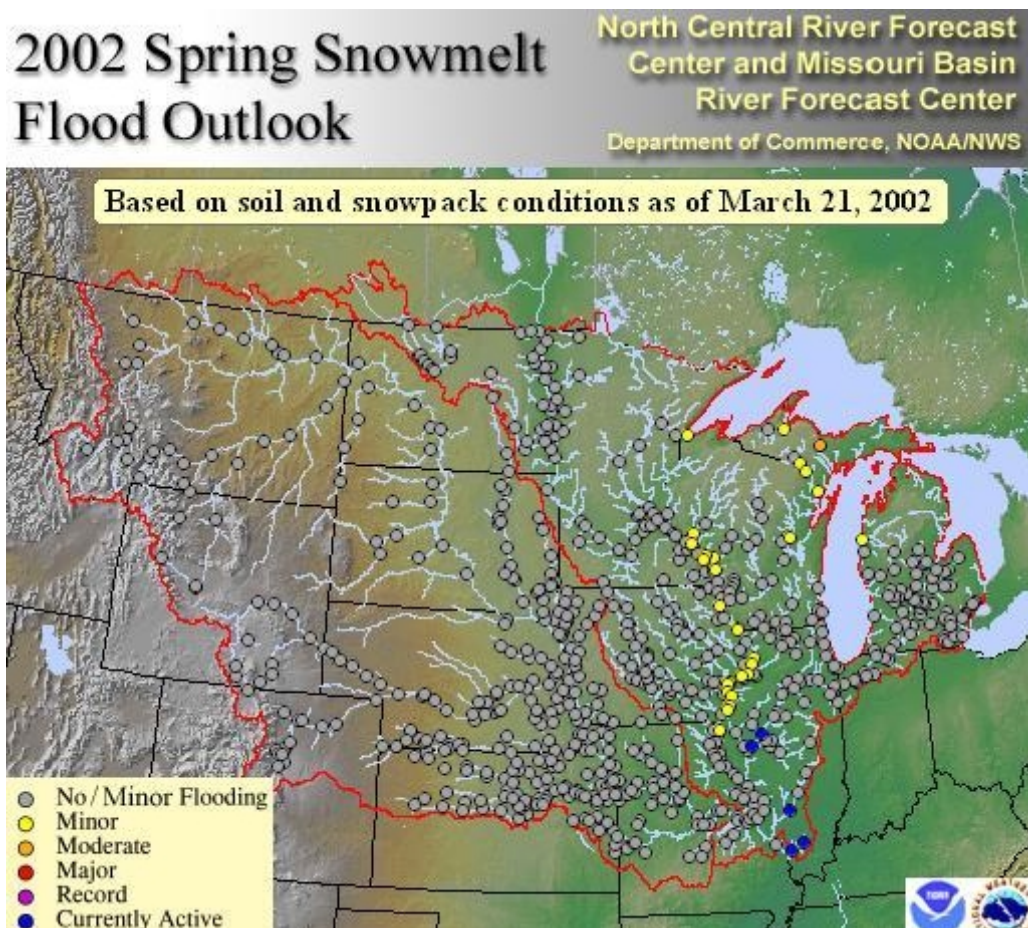


Figure 1.

# Are We Good or Are We Good!! ! 'What Verification is All About'

- Dick Felch

To paraphrase the former head of General Electric, "if you can't measure it, you can't fix it." The North Central River Forecast Center (NCRFC) has been verifying river stage and forecast data for thirteen locations for up to twenty-one years. The longest records include five stations along the Mississippi and Illinois Rivers; an additional eight mainstem stations have been tracked for fourteen years. This record provides an excellent way to evaluate how well we have been doing over the years, determine if and when something is changed, and hopefully see the value in some of the technological changes that have been implemented over the past decade. Since the mainstem forecasts incorporate forecasts for other contributing tributaries, these long-term verification statistics can serve as indicators of long-term trends in hydrologic forecasting capabilities.

## What do we measure?

The NCRFC effort has focused on the "average absolute error" statistic. Average absolute error is defined as the absolute value of the difference (measured in feet) between the forecasted stage for a given date and the actual observed stage on that date. The monthly average error is defined as the average of all the daily absolute daily errors for that month. Other statistics are being added to the verification process, but a long term record must still be developed.

## How well do we do?

This is a good case where "a picture is worth a thousand words". Figure 2 (on page 4) shows the average absolute error lumped by year for Chester Illinois, the southern most point for the NCRFC. It does, to a degree, show how well the NCRFC is doing over the entire Mississippi River drainage system down to that point. The three time series plots on the chart represent the error for the 1-, 2-, and 3-day forecasts. The graph points out several items:

1. There is considerable variability from one year to the next depending on weather conditions. Higher variability is generally associated with larger amounts of summertime convective activity over significant portions of the NCRFC forecast area. Those years where the spring melt and runoff from heavy snowpack dominate the overall statistics are generally more favorable.
2. There is a downward trend in the "average absolute error" statistic for all three forecast periods. On average, the forecast error has decreased by approximately 30 percent for all of the forecast periods. On average, the one-day forecast has improved from 0.35 to 0.25 feet; the two-day forecast has improved from 0.70 to 0.55 feet; the three-day forecast has improved from approximately 1.1 feet to 0.80 feet.

3. Although not shown here, the same trends hold true with upstream forecast points, although the variability and error values are smaller.

## Why are we Getting Better?

There have been a number of technological improvements over the past twenty years which all contribute, to some degree, to the improvement in forecasting skill. It is not possible to separate the individual contributions, but they include the incorporation of quantitative precipitation forecasts, the utilization of radar-imagery to improve estimates of current rainfall patterns, the implementation of the Sacramento hydrological model over many of the NCRFC basins, improvements in data collection networks, and the development of graphical interfaces which allow the forecaster to look at more detailed data in a shorter period of time.

## What's the Point?

The establishment of long term verification statistics provides a measure of how well forecasting skills have improved over time. They also provide a benchmark for measuring future improvements in forecasting skill as newer technologies are incorporated into the NCRFC system. Within the next two years, the entire NCRFC forecast area will utilize the Sacramento model. We will also have baseline values established for the days four and five forecasting skill.

SO ARE WE GOOD?: YAH, YOU BETCHA!!!\*  
GONNA GET BETTER?: YAH, YOU BETCHA!!!\*

\* Minnesotan for yes!!!

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## HIC Insights, Continued from page 1

to record flooding based on current snow and soil moisture conditions and normal precipitation.

We continue to add new forecast service in Michigans' upper peninsula and Iowa as needed. We continue to forge ahead with AHPS, bringing an additional six forecast groups on line by October 2002. Probabilistic forecasts will be issued for the entire NCRFC area by the end of FY05. We continue to educate our users by visiting holding seminars and visiting offices. We are exploring other options for the AHPS product suite and hope to have some experimental products on line this summer.

Dan Luna, Hydrologist-in-Charge NCRFC

**The NCRFC Routings is now on-line. View it at:**  
**<http://www.crh.noaa.gov/ncrfc/documents/Papers/Newsletter/>**

# CHESTER IL - MISSISSIPPI R AVG ABSOLUTE DAILY FORECAST ERROR BY YEAR: 1981-2001

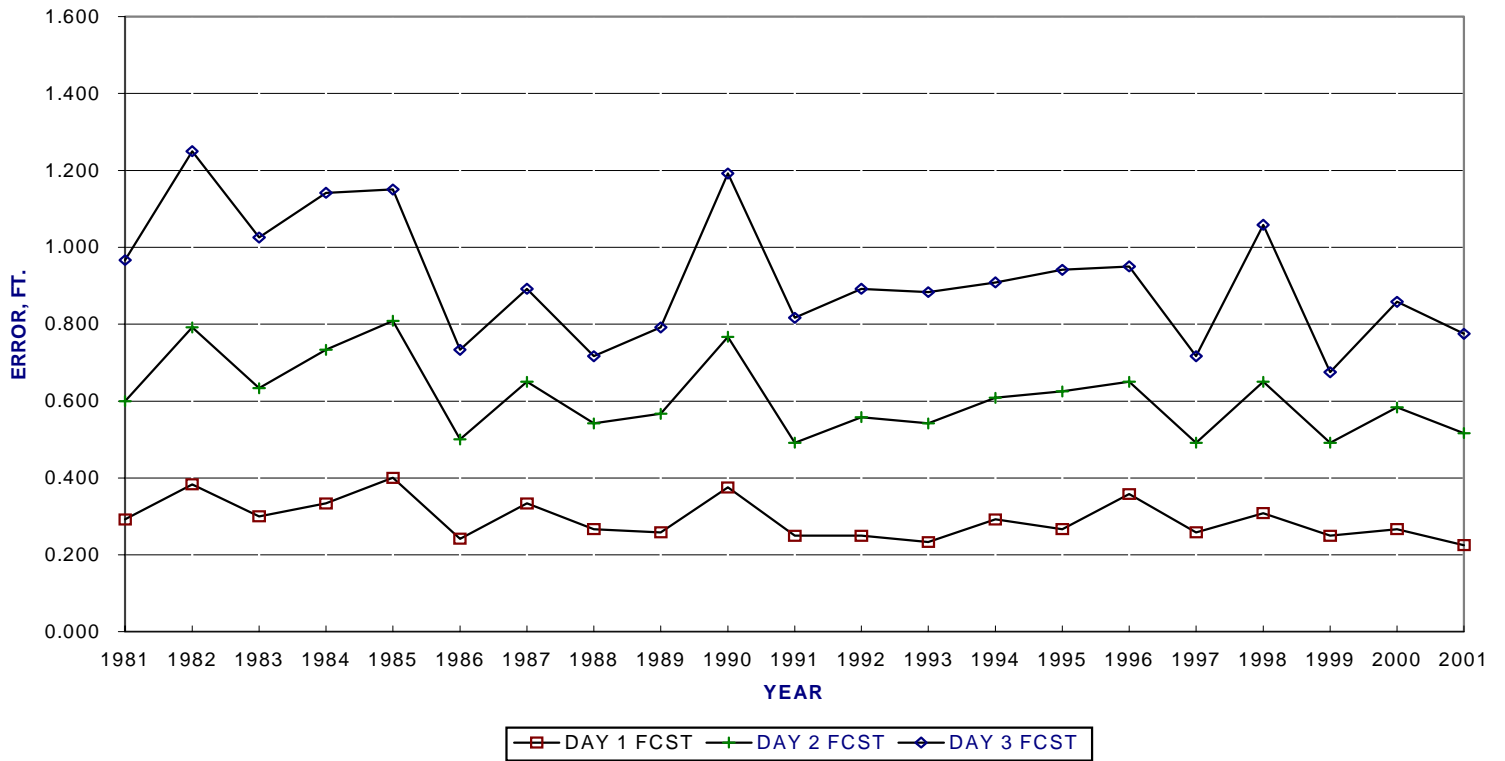


Figure 2.

NCRFCs Web Address:  
<http://www.crh.noaa.gov/ncrfc/>